

Shakett Creek Stream Assessment

Study Area

The Shakett Creek assessment includes Shakett Creek as well as the Fox Creek and Salt Creek tributaries. The Shakett Creek watershed is dominated by natural/open Land (37.15%), pasture (33.22%) and residential (19.52%) land uses with a watershed LDI value of 20.96. The Fox Creek tributary land use is dominated by pasture (34.18%), residential (25.6%) and natural/open land (22.76%) with an LDI value of 20.98. The Salt Creek tributary watershed is dominated by natural land (61.6%), pasture (31.6%) and industrial (10.51%) land uses with an LDI value of 25.62. Shakett Creek discharges to Lemon Bay.

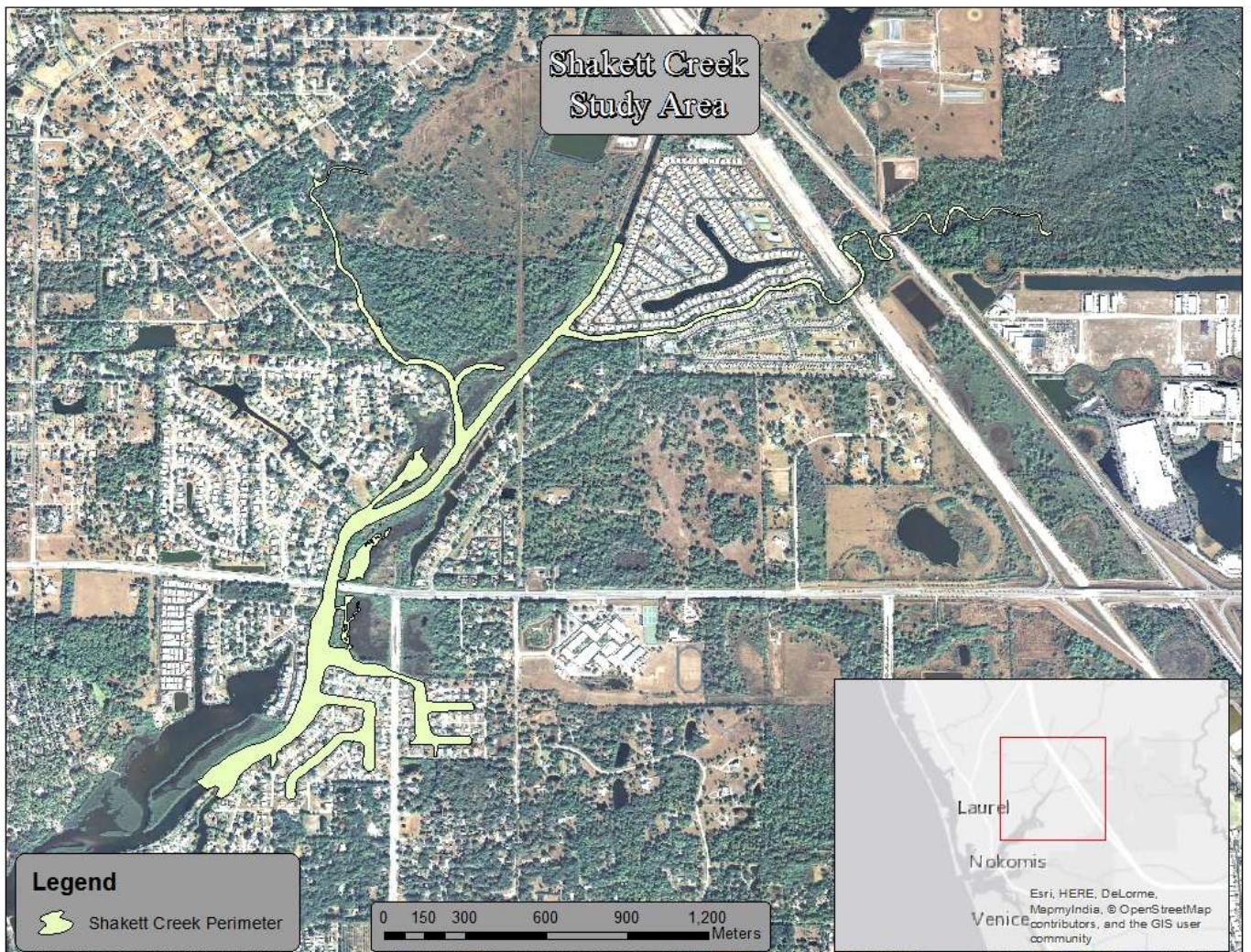


Figure 36. Overview of the Shakett Creek Study Area

Vegetation Survey

The Shakett Creek vegetation assessment encompassed 43 vegetation regions from the mouth in Lemon Bay to the weir, including the Fox and Salt Creek tributaries as shown in Figure 37. In these regions, 68 species of vegetation were identified. Regions 1 through 20 were dominated by mangroves (*Rhizophora mangle*, *Laguncularia racemosa* and *Avicennia germinans*) with few other salt tolerant species present. The first occurrence of Leather Fern (*Acrostichum danaeifolium*) was in Region 17, becoming co-dominant in regions 42 and 43. Needle Rush (*Juncus roemerianus*) was first observed in Region 3 with the last occurrence in Region 19 on Shakett Creek and 41 on Salt Creek. Above Region 20 on Shakett Creek the vegetation communities are dominated by Brazilian Pepper (*Schinus terebinthifolius*) indicative of increasing freshwater influence. Above Region 26 on Fox Creek the vegetation community includes several species that indicate a transition to freshwater dominance including Cattails (*Typha* spp.) and Common Bacopa (*Bacopa monnieri*).

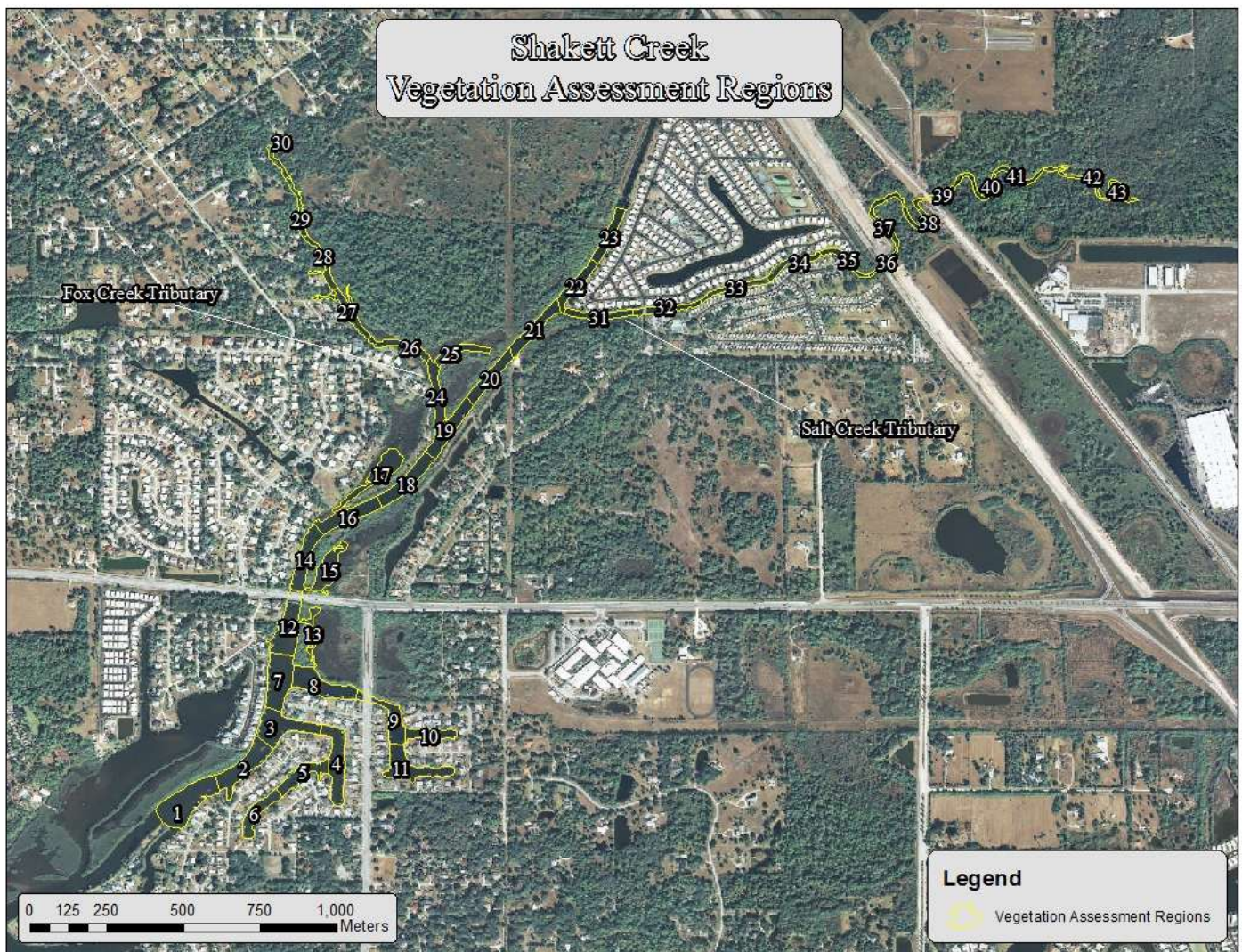


Figure 37. Overview of Shakett Creek Vegetation Assessment Regions

Figure 38 shows the vegetation transition zone of Shakett Creek indicating the most downstream Leather Fern and Needle Rush (*Juncus*). Based on the vegetation assessment data for Shakett Creek, Regions 1 through 18 would comprise the highest salinity and tidal influence zone. Regions 19 through 23 would comprise the “mixing” zone in Shakett Creek, 24 and 25 in Fox Creek, and 31 through 40 in Salt Creek. Above Region 23 in Shakett Creek, 26 in Fox Creek and 41 in Salt Creek would comprise the freshwater dominant zone. The vegetation assessment species lists are shown in Table 10 and Table 11.

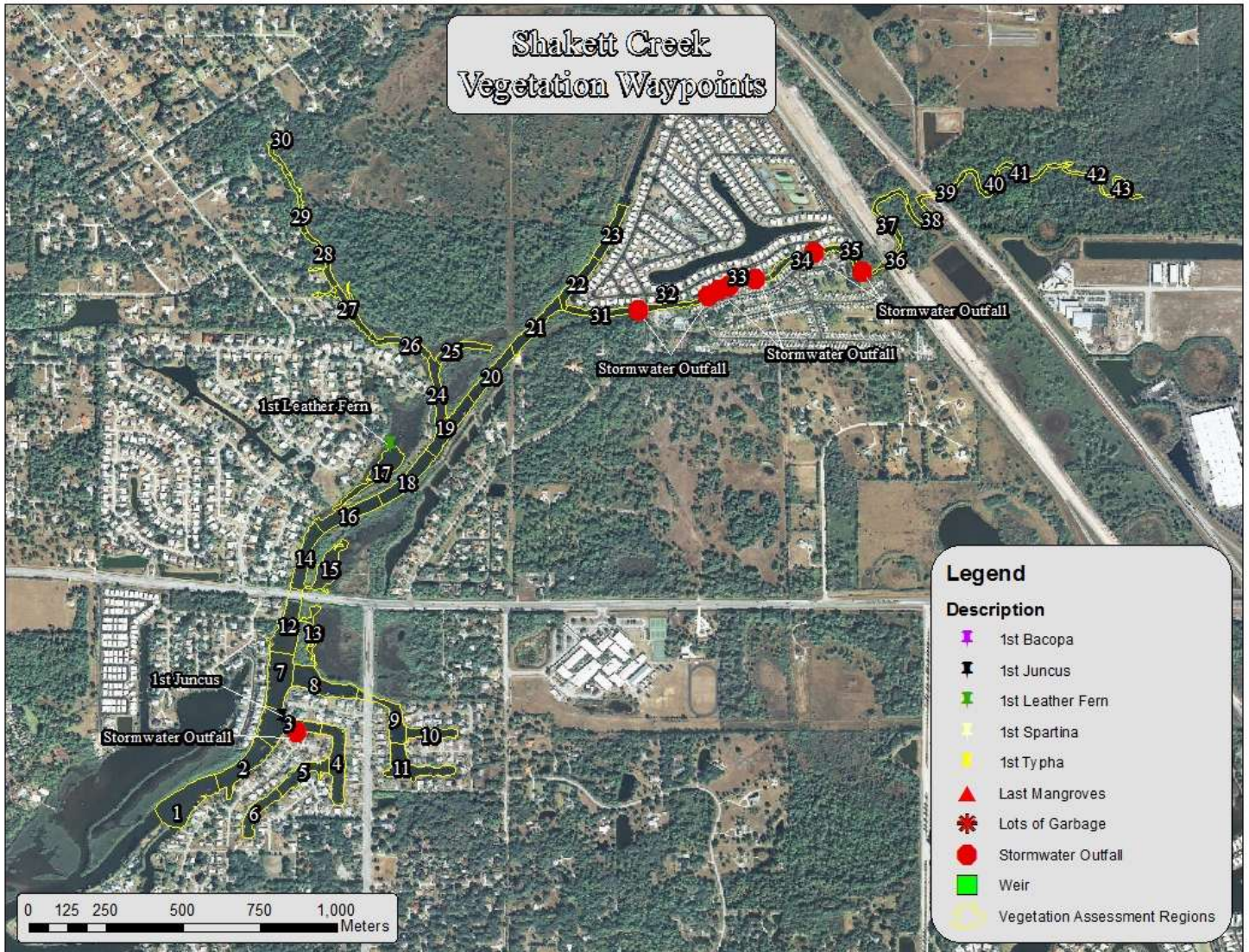


Figure 38. Shakett Creek Vegetation Waypoints

Table 8 Shakett Creek Vegetation Assessment List

Plant Species	Common Name	Sample Region																							Regions Found
		Shakett Creek																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
<i>Laguncularia racemosa</i>	White Mangrove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	42	
<i>Schinus terebinthifolius</i>	Brazilian Pepper	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	41	
<i>Rhizophora mangle</i>	Red Mangrove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	40	
<i>Sabal palmetto</i>	Sabal Palm			1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	35	
<i>Spartina alterniflora</i>	Salt Marsh Grass	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25	
<i>Juncus roemerianus</i>	Needle Rush, Black Rush			1	1			1	1		1		1	1	1	1	1		1					23	
<i>Pistia stratioides</i>	Water Lettuce	1	1	1			1	1	1			1		1		1	1				1	1	1	23	
<i>Avicennia germinans</i>	Black Mangrove	1	1	1			1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	19	
<i>Acrostichum danaeifolium</i>	Leather Fern																1					1		18	
<i>Myrica cerifera</i>	Wax Myrtle									1										1	1	1	1	18	
<i>Quercus geminata</i>	Sand Live Oak							1			1				1	1	1	1	1	1	1	1	1	18	
<i>Sphagneticola (Wedelia) trilobata</i>	Creeping Oxeye			1	1	1			1		1			1					1	1			1	17	
<i>Pinus elliotii</i>	Slash Pine																	1				1	1	15	
<i>Quercus laurifolia</i>	Laurel oak	1			1															1		1		15	
<i>Conocarpus erecta</i>	Buttonwood	1	1	1				1	1	1			1	1	1	1			1	1	1			14	
<i>Baccharis halimifolia</i>	Eastern False Willow, Saltbush		1		1	1			1	1	1							1		1				13	
<i>Crinum americanum</i>	Swamp lily										1			1					1					13	
<i>Typha spp.</i>	Cattails									1	1							1						12	
<i>Juniperus virginiana</i>	Red Cedar	1							1					1			1		1	1	1	1	1	11	
<i>Leucaena leucocephala</i>	White leadtree		1		1				1			1		1	1	1	1	1	1	1	1			10	
<i>Serenoa repens</i>	Saw palmetto																							10	
<i>Eustachys glauca</i>	Saltmarsh Finger Grass				1	1	1			1							1	1	1					9	
<i>Vitis rotundifolia</i>	Muscadine Grape										1			1										8	
<i>Coccoloba uvifera</i>	Seagrape	1	1		1	1	1				1													7	
<i>Quercus virginiana</i>	Virginia Live Oak	1					1				1													7	
<i>Bacopa monnieri</i>	Common Bacopa, Herb-Of-Grace																		1					6	
<i>Distichlis spicata</i>	Salt Grass			1	1				1		1								1					6	
<i>Erythrina herbacea</i>	Coral Bean																							5	
<i>Panicum repens</i>	Torpedo Grass																		1					5	
<i>Quercus nigra</i>	Water Oak																1							5	
<i>Solidago sempervirens</i>	Goldenrod								1										1			1		5	
<i>Iva frutescens</i>	Marsh Elder								1										1	1		1		4	
<i>Parthenocissus quinquefolia</i>	Woodbine																						1	4	
<i>Bidens alba</i>	White Beggar Ticks				1	1					1													3	
<i>Blutaparon vermiculare</i>	Silverhead, Saltweed				1	1					1													3	
<i>Borrichia frutescens</i>	Sea Oxeye																					1		3	
<i>Dalbergia ecastaphyllum</i>	Coin Vine	1	1						1															3	
<i>Panicum maximum</i>	Guneagrass						1	1																3	
<i>Alternanthera philoxeroides</i>	Alligator Weed																			1	1			2	
<i>Carya aquatica</i>	Water Hickory																							2	
<i>Casuarina equisetifolia</i>	Australian Pine	1							1															2	
<i>Cupaniopsis anacardioides</i>	Carrotwood								1	1														2	
<i>Cyperus ligularis</i>	Flat Sedge						1																	2	
<i>Eupatorium capillifolium</i>	Dog Fennel										1								1					2	
<i>Imperata cylindrica</i>	Cogon Grass																				1		1	2	
<i>Lantana spp.</i>	Lantana																	1		1				2	
<i>Paspalum urvillei</i>																								2	
<i>Salix caroliniana</i>	Carolina Willow; Coastalplain Willow																							2	
<i>Sapium sebiferum</i>	Popcorn Tree, Chinese Tallow Tree																					1		2	
<i>Scirpus californicus</i>	California Bulrush																							2	
<i>Spartina bakerii</i>	Cordgrass																						1	2	
<i>Urochloa mutica</i>	Para Grass																						1	2	
<i>Blechnum serrulatum</i>	Swamp Fern																							1	
<i>Cyperus involucratus</i>	Umbrella flat sedge										1													1	
<i>Dalbergia sissoo</i>	Indian Rosewood																							1	
<i>Eclipta alba (prostrata)</i>	False Daisy, Yerba De Tajo																							1	
<i>Ficus aurea</i>	Strangler Fig											1												1	
<i>Fraxinus caroliniana</i>	Pop Ash																							1	
<i>Hydrocotyl umbellata</i>	Manyflower Marshpennywort, Water Pennywort																							1	
<i>Koeleruteria elegans</i>	Golden Rain Tree																				1			1	
<i>Ludwigia peruviana</i>	Peruvian Primrosewillow																						1	1	
<i>Lycopus virginicus</i>	Virginia Bugleweed																							1	
<i>Phragmites australis</i>	Common Reed																							1	
<i>Phyla nodiflora</i>	Frog-fruit, Carpetweed, Turkey Tangle Fogfruit																					1		1	
<i>Ricinus communis</i>	Castor Bean																							1	
<i>Syzgium cumini</i>	Java Plum																							1	
<i>Taxodium distichum</i>	Bald Cypress																							1	
<i>Ximenia americana</i>	Tallow Wood, Hog Plum																							1	

Table 9. Fox and Salt Creek Vegetation Assessment List

Plant Species	Common Name	Sample Region																				Regions Found
		Fox Creek										Salt Creek										
		24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	
<i>Laguncularia racemosa</i>	White Mangrove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	42	
<i>Schinus terebinthifolius</i>	Brazilian Pepper	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	41	
<i>Rhizophora mangle</i>	Red Mangrove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	40	
<i>Sabal palmetto</i>	Sabal Palm	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	35	
<i>Spartina alterniflora</i>	Salt Marsh Grass	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	25	
<i>Juncus roemerianus</i>	Needle Rush, Black Rush	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23	
<i>Pistia stratioides</i>	Water Lettuce	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23	
<i>Avicennia germinans</i>	Black Mangrove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	
<i>Acrostichum danaeifolium</i>	Leather Fern	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	
<i>Myrica cerifera</i>	Wax Myrtle	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	
<i>Quercus geminata</i>	Sand Live Oak	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	
<i>Sphagneticola (Wedelia) trilobata</i>	Creeping Oxeye	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	
<i>Pinus elliotii</i>	Slash Pine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	
<i>Quercus laurifolia</i>	Laurel oak	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	
<i>Conocarpus erecta</i>	Buttonwood	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	
<i>Baccharis halimifolia</i>	Eastern False Willow, Saltbush	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13	
<i>Crinum americanum</i>	Swamp lily	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13	
<i>Typha spp.</i>	Cattails	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12	
<i>Juniperus virginiana</i>	Red Cedar	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11	
<i>Leucaena leucocephala</i>	White leadtree	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	
<i>Serenoa repens</i>	Saw palmetto	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	
<i>Eustachys glauca</i>	Saltmarsh Finger Grass	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9	
<i>Vitis rotundifolia</i>	Muscadine Grape	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	
<i>Coccoloba uvifera</i>	Seagrape	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	
<i>Quercus virginiana</i>	Virginia Live Oak	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	
<i>Bacopa monnieri</i>	Common Bacopa, Herb-Of-Grace	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	
<i>Distichlis spicata</i>	Salt Grass	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	
<i>Erythrina herbacea</i>	Coral Bean	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	
<i>Panicum repens</i>	Torpedo Grass	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	
<i>Quercus nigra</i>	Water Oak	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	
<i>Solidago sempervirens</i>	Goldenrod	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	
<i>Iva frutescens</i>	Marsh Elder	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	
<i>Parthenocissus quinquefolia</i>	Woodbine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	
<i>Bidens alba</i>	White Beggar Ticks	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
<i>Blutaparon vermiculare</i>	Silverhead, Saltweed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
<i>Borrchia frutescens</i>	Sea Oxeye	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
<i>Dalbergia ecastaphyllum</i>	Coin Vine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
<i>Panicum maximum</i>	Guneagrass	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	
<i>Alternanthera philoxeroides</i>	Alligator Weed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Carya aquatica</i>	Water Hickory	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Casuarina equisetifolia</i>	Australian Pine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Cupaniopsis anacardioides</i>	Carrotwood	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Cyperus ligularis</i>	Flat Sedge	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Eupatorium capillifolium</i>	Dog Fennel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Imperata cylindrica</i>	Cogon Grass	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Lantana spp.</i>	Lantana	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Paspalum urvillei</i>	Carolina Willow; Coastalplain Willow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Salix caroliniana</i>	Popcorn Tree, Chinese Tallow Tree	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Scirpus californicus</i>	California Bulrush	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Spartina bakerii</i>	Cordgrass	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Urochloa mutica</i>	Para Grass	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	
<i>Blechnum serrulatum</i>	Swamp Fern	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Cyperus involucrat</i>	Umbrella flat sedge	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Dalbergia sissou</i>	Indian Rosewood	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Eclipta alba (prostrata)</i>	False Daisy, Yerba De Tajo	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Ficus aurea</i>	Strangler Fig	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Fraxinus caroliniana</i>	Pop Ash	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Hydrocotyl umbellata</i>	Manyflower Marshpennywort, Water Pennywort	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Koeleruteria elegans</i>	Golden Rain Tree	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Ludwigia peruviana</i>	Peruvian Primrosewillow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Lycopus virginicus</i>	Virginia Bugleweed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Phragmites australis</i>	Common Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Phyla nodiflora</i>	Frog-fruit, Carpetweed, Turkey Tangle Fogfruit	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Ricinus communis</i>	Castor Bean	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Syzygium cumini</i>	Java Plum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Taxodium distichum</i>	Bald Cypress	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<i>Ximania americana</i>	Tallow Wood, Hog Plum	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Habitat Assessment

Collected sonar data were processed through Dr. Depth software to analyze the strength of the return signal from the bottom to get an estimate of the relative bottom hardness for Shakett Creek. Figure 39 shows the bottom hardness raster for Shakett Creek. This map is meant to help identify locations of harder and softer bottoms for benthic invertebrate sampling, fish sampling and benthic chlorophyll sampling.

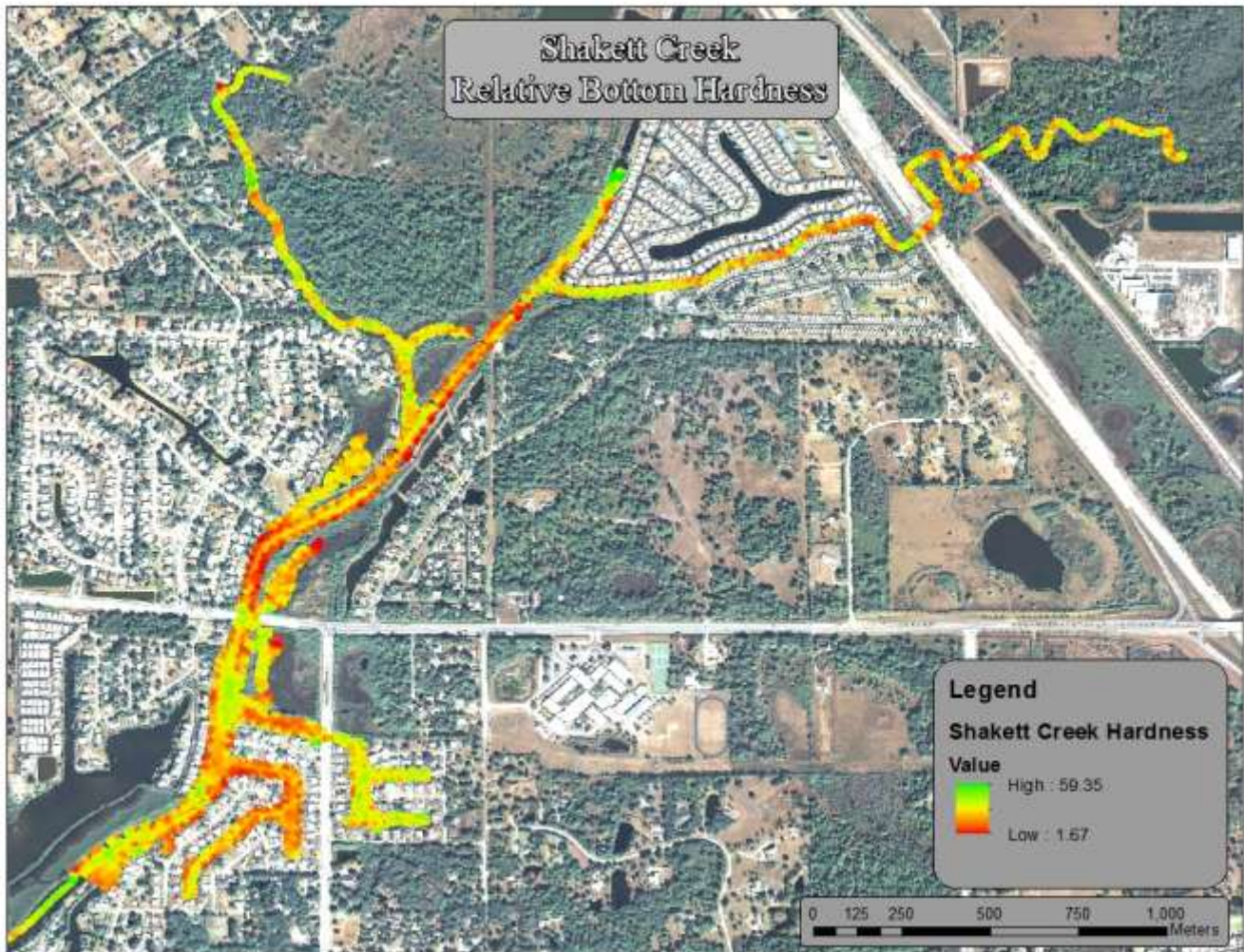


Figure 39. Shakett Creek Relative Bottom Hardness Map

Bathymetry Mapping

In the study area, Shakett Creek had a mean depth of 3.18 feet and a maximum depth of 9.06 feet. A total of 64.73 acres of creek was mapped during the assessment. At the time of assessment, Shakett Creek contained an estimated 62,979,386 gallons of water in the study area. The water level elevation of Shakett Creek was 2.12 feet at USGS 2299727 station. Figure 40 details the bathymetric mapping for Shakett Creek showing the three depth strata.

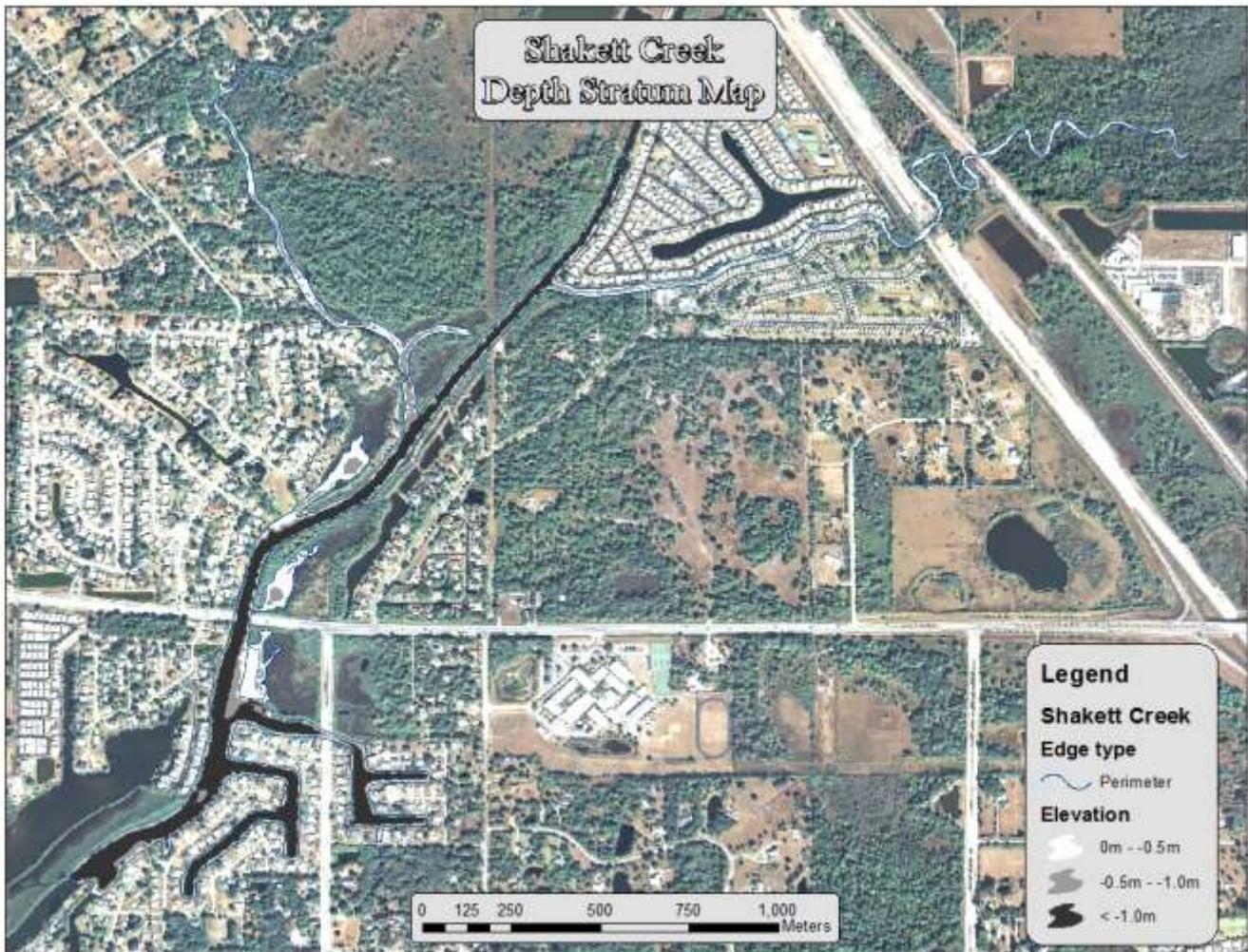


Figure 40. Shakett Creek Bathymetric Stratum Map